

CLAMP AND CLAMP ATTACHED ARTICLE CARRIER

Technical Field

The present invention relates to clamps and article carriers, and more particularly to a clamps and
5 article carriers for attachment to a bicycle handlebar or other tube.

Background Art

Article carriers are attached to bicycles when the bicycle rider wishes to transport additional items.
10 Generally, bags are attached to handlebars and racks are attached behind the seat. Most prior known bags and racks are attached with clamps that are secured around a tube, such as the handlebars, seatpost or seat tube, with screws or bolts. Such clamps require time and tools for attachment
15 and removal. In order to minimize bicycle weight and air resistance, it is desirable to have a clamp for such article carriers that firmly grasps the tube and is capable of quick release without tools, to quickly remove the article carrier when not in use.

20 Bulky and irregularly shaped articles, such as skateboards, can be difficult to attach to and awkward to carry on generic bicycle article carriers. Carriers specifically configured to carry such articles are desirable. Quick removal of such a carrier and/or attachment
25 of a differently configured carrier is also desirable. Many handlebars are curved and it is often desirable to clamp an article carrier to an angled or vertical portion of a handlebar.

Disclosure of the Invention

A bicycle attached article carrier includes a body and a clamp. The body is configured for a specific article type and includes a clamp mounting projection. The clamp is
5 rotably attached to the body such that the body can be rotated 360 degrees relative to the body. The clamp has first and second clamp members, a link member and an actuator. The base of the first clamp member mounts around the clamp mounting projection of the body. The base of the
10 second clamp member pivotally mounts on the link member. The actuator has a cylindrical portion that rotably mounts in the body adjacent to the clamp mounting surface and a handle attached to the cylindrical portion. The cylindrical portion includes an eccentric cavity and a circumferentially
15 extending slot extending from the eccentric cavity to the outer surface of the cylindrical portion. The link member extends from the base of the second clamp member through the base of the first clamp member, into the body and through the slot in the cylindrical portion, and has a barrel shaped
20 end that rotably mounts in the eccentric cavity. The first and second clamp members extend from the bases around opposite sides of a tube and have interlocking tips opposite the bases that are pulled into interlocking engagement by the link member when the handle is turned.

25 Brief Description of the Drawings

Details of this invention are described in connection with the accompanying drawings that bear similar reference numerals in which:

Figure 1 is a rear perspective view of an article carrier embodying features of the present invention.

Figure 2 is an exploded front perspective view of the carrier of Figure 1.

5 Figure 3 is an enlarged perspective view of the tip of the first clamp member of the carrier of Figure 1.

Figure 4 is an enlarged perspective view of the tip of the second clamp member of the carrier of Figure 1.

10 Figure 5 is a perspective view of the actuator of the carrier of Figure 1.

Figure 6 is a partial sectional view taken along line 6-6 of Figure 1 with the clamp open.

Figure 7 is a side elevation view of the clamp of the carrier of Figure 1 with the clamp partially closed.

15 Figure 8 is a side elevation view of the clamp of the carrier of Figure 1 with the clamp closed.

Figure 9 is a perspective view of an alternative article carrier embodying features of the present invention.

Detailed Description Of The Invention

20 Referring now to Figures 1 and 2, an article carrier 10 embodying features of the present invention includes a body 11 and clamp 12. The article carrier 10 in the illustrated embodiment, as shown in Figure 1, is sized to clamp onto the handlebar 14 of a bicycle and the body 11
25 is configured to carry a skateboard. Generally, for carrying

a skateboard, two laterally spaced article carriers 10 would be used with one article carrier 10 attached to each handlebar 14. The body 11 shown may carry other flat articles. The body 11 may also be configured specifically
5 for carrying other types of articles. Clamp 12 is suitable for clamping around other rigid round tubes.

Describing the specific embodiments herein chosen for illustrating the invention, certain terminology is used which will be recognized as being employed for convenience
10 and having no limiting significance. For example, the terms "front", "back", "top", "bottom" and "side" refer to the illustrated embodiment in its normal position of use. The terms "inward" and "outward" refer to directions toward and away from the geometric center of the apparatus. Further,
15 all of the terminology above-defined includes derivatives of the word specifically mentioned and words of similar import.

The body 11 is generally J shaped with a long leg 15 connected at the bottom to the bottom of a short leg 16 by a curved section 17 to form a groove 18. The groove 18
20 shown is sized and shaped to receive a skateboard. The top end 21 of the long leg 15 is configured to fixedly hold one end of an elastic cord 22. A knob 23 is attached to the opposite end of the elastic cord 22. The top end 25 of the short leg 16 hooks outward and downward, and is split by a
25 slot 26. The elastic cord 22 is wrapped over the skateboard and through the slot 26 with the knob 23 hooked into the top end 25 of the short leg 16 to secure the skateboard in the body 11.

The long leg 15 has an outwardly extending,
30 cylindrical clamp mounting projection 27, between the curved

section 17 and the top end 21. A cylindrical clamp actuator cavity 29 extends laterally through the long leg 15, inward of the clamp mounting projection 27. A cylindrical link member aperture 30 extends through the clamp mounting
5 projection 27 and the long leg 15 to the clamp actuator cavity 29.

The clamp 12 includes opposed first and second clamp members 32 and 33, an actuator 34 and a link member 35. The first clamp member 32 has a base 37, an intermediate
10 portion 38 that extends outwardly from the base 37, and a tip 39 at the outward end of the intermediate portion 38. A cylindrical clamp mounting aperture 40, sized to fit around the clamp mounting projection 27, extends through the base 37. The intermediate portion 38 of the first clamp member 32
15 extends upwardly and outwardly, then curves outwardly and downwardly, with an inner surface 45 that is sized and shaped to wrap partially around the handlebars 14. As shown in Figure 3, the tip 39 has a first interlocking portion 47 in the form of two spaced fingers 48, separated by a notch
20 49, that curve outwardly from the end of the intermediate portion 38.

Referring again to Figures 1 and 2, the second clamp member 33 has a base 52, an intermediate portion 53 that extends outwardly from the base 52, and a tip 54 at the
25 outward end of the intermediate portion 53. The base 52 has an inner end 56 and a spaced, outwardly opening, semi-spherical link member cavity 57 that extends inwardly into the base 52. A vertically elongated link member aperture 58 extends through the base 52 from the link member cavity 57
30 to the inner end 56. The intermediate portion 53 of the

second clamp member 33 extends downwardly and outwardly, then curves outwardly and upwardly, with an inner surface 60 that is sized and shaped to wrap partially around the handlebar 14, opposite the first clamp member 32.

5 As shown in Figure 4, the tip 54 has a second interlocking portion 61 in the form of a tab 62 and a peg 63 extending transversely through the tab 62. The tab 62 extends upwardly from the end of the intermediate portion 53 and is sized to fit into the notch 49 of the first
10 interlocking portion 47. The peg 63 is spaced from the end of the intermediate portion 53 such that the fingers 48 of the first interlocking portion 47 fit between the peg 63 and the end of the intermediate portion 53. The distance from the tab 62 of the tip 54 to the inner end 56 of the base 52
15 of the second clamp member 33 is selected to be slightly less than the distance from the notch 49 of the tip 39 to the outer face 42 of the base 37 of the first clamp member 32.

 Referring to Figure 5, the actuator 34 has a
20 cylindrical portion 65 that rotatably mounts about a first axis 66 in the clamp actuator cavity 29 of the body 11 and a handle 67 that attaches an end of the cylindrical portion 65 and extends transversely therefrom. The cylindrical portion 65 has an outer surface 68 and a cylindrical eccentric
25 cavity 69 extends laterally through the cylindrical portion 65, having a center second axis 70 spaced a selected distance from the first axis 66. In the illustrated embodiment the eccentric cavity 69 is about 90 degrees counterclockwise from the handle 67 when viewed with the
30 handle 67 behind the cylindrical portion 65 or about 90

degrees clockwise from the handle 67 when viewed with the cylindrical portion 65 behind the handle 67. A radial slot 71, connecting the eccentric cavity 69 to the outer surface 68, extends around the cylindrical portion 65 from about the point where the eccentric cavity 69 is nearest to the outer surface 68 slightly over 180 degrees to beyond the point where the eccentric cavity 69 is farthest from the outer surface 68.

The link member 35, as shown in Figure 2, has an elongated, cylindrical intermediate portion 73, a spherical first end 74 attached to the intermediate portion 73, and a spaced cylindrical second end 75 attached transversely to the intermediate portion 73 opposite the first end 74. The first end 74 is sized and shaped to fit into the link member cavity 57 of the second clamp member 33. The second end 75 is sized and shaped to fit into the eccentric cavity 69 of the cylindrical portion 65 of the actuator 34. In the illustrated embodiment the intermediate portion 73 is an allen head screw 77, the first end 74 is a spherical retainer 78 that receives the head of the screw 77, and the second end 75 is a barrel nut 79 removable from the screw 77.

The clamp 12 is assembled with the clamp mounting aperture 40 of the base 37 of the first clamp member 32 over the clamp mounting projection 27 on the long leg 15 of the body 11 and the cylindrical portion 65 of the actuator 34 in the clamp actuator cavity 29 of the body 11. The first end 74 of the link member 35 is assembled into the link member cavity 57 of the second clamp member 33 with the intermediate portion 73 of the link member 35 between the

base tabs 56. The intermediate portion 73 of the link member 35 extends through the link member aperture 58 of the second clamp member 33, the base 37 of the first clamp member 32 and the link member aperture 30 of the long leg 15 of the body 11. The second end 75 of the link member 35 is assembled into the eccentric cavity 69 of the cylindrical portion 65 of the actuator 34.

Referring to Figure 6, when the actuator 34 is turned such that the eccentric cavity 69 is nearest to the clamp mounting surface 28 of the long leg 15 of the body 11, the second clamp member 33 is released from the first clamp member 32 and can rotate downwards. To clamp the carrier 10 onto the handlebar 14, the inner surface 45 of the intermediate portion 38 of the first clamp member 32 is positioned on the handlebar 14. The second clamp member 33 is rotated upwards so that the inner surface 60 of the intermediate portion 53 of the second clamp member 33 is positioned against the handlebar 14, as shown in Figure 7. Referring to Figure 8, the handle 67 of the actuator 34 is rotated so that the eccentric cavity 69 moves away from the clamp mounting surface 28 of the long leg 15 of the body 11, pulling the link member 35 inwards. The link member 35 pulls the base 52 of the second clamp member 33 towards the base 37 of the first clamp member 32. The link member 35 thereby pulls the first and second interlocking portions 47 and 61 into interlocking engagement, with the tab 62 on the tip 54 of the second clamp member 33 in the notch 49 on the tip 39 of the first clamp member 32, and the fingers 48 on the tip 39 of the first clamp member 32 between the peg 63 on the tip 54 and the end of the intermediate portion 53 of the second clamp member 33.

When the clamp 12 is clamped, with the first and second interlocking portions 47 and 61 engaged, the second clamp member 33 hinges slightly at the tip 54 relative to the first clamp member and the tension on the second clamp member 33 from the pull by the link member 35 causes the intermediate portions 38 and 53 of the first and second clamp members 32 and 33 to squeeze together and firmly grasp the handlebar 14.

When the clamp 12 is clamped, with the first and second interlocking portions 47 and 61 engaged, the tension on the second clamp member 33 from the pull by the link member 35 pulls the base 37 of the first clamp member 32 against the body 11, so that the body 11 is prevented from rotating relative to the clamp 12. When the actuator 34 is turned to release the tension of the link member 35, the first clamp member 32, and thereby the clamp 12, rotates freely relative to the body 11. By way of example, and not as a limitation, other interfaces between the body 11 and the clamp 12, such as a clamp mounting projection on the body 11 that fits into a recess in base 37 of the first clamp member 32, may be provided to prevent rotation of the body 11 relative to the clamp 12 when the clamp 12 is clamped, and allow rotation when the clamp 12 is unclamped.

The first and second interlocking portions 47 and 61, shown as the fingers 48 and the peg 63, when engaged, prevent the second clamp member 33 from moving downwardly or laterally relative to the first clamp member 32. The first and second interlocking portions 47 and 61 can take other forms. By way of example, and not as a limitation, the first and second interlocking portions 47 and 61 can be a recess

and tab, or a round, polyhedral or irregular hole and an interfitting peg.

The article carrier 10 described and shown in the Figures can be quickly and easily attached or released from a substantially rigid tube without the use of tools.
5 Although the article carrier 10 is described and shown with a substantially vertical body 11, the clamp 12 can clamp the body 11 at any angle on a round tube. The body 11 can be rotated relative to the clamp 12 so that clamp 12 can be
10 clamped onto a vertical or horizontal tube, a curved tube or a tube at any angle and the article can be carried at any desired angle.

Referring to Figure 9, an alternative article carrier 80 embodying features of the present invention
15 includes a body 81 and clamp 82 for clamping onto a handlebar 84. The body 81 is generally J shaped with a long leg 85 connected at the bottom to the bottom of a short leg 86 by a curved section 87 to form a groove 88. The groove 88 shown is sized and shaped to receive a skateboard. The top
20 end 91 of the long leg 85 is configured to fixedly hold one end of an elastic cord 92. A knob 93 is attached to the opposite end of the elastic cord 92. The top end 95 of the short leg 86 hooks outward and downward, and is split by a slot 96. The elastic cord 92 is wrapped over the skateboard
25 and through the slot 96 with the knob 93 hooked into the top end 95 of the short leg 86 to secure the skateboard in the body 81. The long leg 85 has a substantially flat, outwardly facing clamp mounting surface 98 between the curved section 87 and the top end 91. An internally threaded first body

mounting aperture 99 extends into the long leg 85 from the clamp mounting surface 98.

The clamp 82 has a first clamp member 101 and a second clamp member 102. The first clamp member 101 has a first section 104 sized and shaped to wrap partially around the handlebar 84 and a second section 105 that extends from an end of the first section 104. The first section 104 includes two spaced, internally threaded first clamp apertures 106 at each end. The second clamp member 102 is sized and shaped to wrap partially around the handlebar 84, opposite the first section 104 of the first clamp member 101, and includes two spaced, unthreaded second clamp apertures 107 at each end that align with the first clamp apertures 106. Four clamp fixing bolts 108 extend through the second clamp apertures 107 and thread into the first clamp apertures 106 to secure the clamp 82 to the handlebar 84. A second body mounting aperture 109 extends through the second section 105 of the first clamp member 101, and a body fixing bolt 110 through the second body mounting aperture 109 and threaded into the first body mounting aperture 99 secures the body 81 to the clamp 82. When the body fixing bolt 110 is loosened, the body 81 can be rotated to any angle relative to the clamp 82 to allow mounting of the article carrier 80 on a handlebar 84 of any angle.

Although the present invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made by way of example and that changes in details of structure may be made without departing from the spirit thereof.